

CLAIMS

We claim:

1. An intervertebral spacer device comprising:
first and second plate members, each having inner and outer plate surfaces thereof, said plate members being disposed in a spaced apart relationship such that inner ones of said plate surfaces oppose one another, and outer ones of said plate surfaces face in opposite directions; and
at least one restoring force providing element disposed between the first surfaces of said first and second plate members, and disposed such that a compressive load applied to the second surfaces of said plate members is counteracted by said at least one restoring force providing element, said at least one restoring force providing element including at least one belleville washer having at least one radially extending groove and at least one spiral slot.
2. The device as set forth in claim 1, further comprising disposed on at least one of said first and second plate members a retaining wall in which said at least one restoring force providing element is contained.
3. The device as set forth in claim 1, wherein said at least one restoring force providing element includes a belleville washer having a narrow end and a wide end and being oriented such that said wide end is in contact with said inner surface of one of said first and second plate members.
4. The device as set forth in claim 1, wherein said at least one radially extending groove in said at least one belleville washer comprises a plurality of spaced apart radially extending grooves, each of which extends from a locus on a peripheral edge of said at least one belleville washer to a locus which is radially in from said peripheral edge.

5. The device as set forth in claim 4, wherein each of said plurality of radially extending grooves in said at least one belleville washer comprises a linear groove having a length extending from said locus on said peripheral edge toward said locus which is radially in from said peripheral edge, a depth that tapers along said length, and a width that tapers along said length.

6. The device as set forth in claim 5, wherein said depth decreases along said length, and said width decreases along said length.

7. The device as set forth in claim 1, wherein said at least one spiral slot in said at least one belleville washer comprises a plurality of spaced apart spiral slots, each of which extends from a locus on a peripheral edge of said at least one belleville washer to a locus which is radially in from said peripheral edge.

8. The device as set forth in claim 1, wherein one of said first and second plate members further comprises a post structure extending outwardly from said inner surface of said one of said first and second plate members, and which post structure includes a ball-shaped head.

9. The device as set forth in claim 8, wherein said post structure further includes a threaded bore which extends axially from said ball-shaped head toward said inner surface of said one of said first and second plate members, and which bore receives therein a threaded set screw such that prior to an insertion of the set screw therein, said bore permits the ball-shaped head to compress radially inwardly, and such that after the insertion of said set screw said ball-shaped head is not readily radially compressible.

10. The device as set forth in claim 8, wherein said at least one belleville washer further comprises a central opening which includes a curvate volume for receiving and holding therein said ball-shaped head.

11. An intervertebral spacer device comprising:
first and second plate members, each having plate surfaces thereof, said plate members being disposed in a spaced apart relationship such that inner ones of said plate surfaces oppose one another, and outer ones of said plate surfaces face in opposite directions;
said first plate member further including a retaining wall extending outwardly from said inner surface of said first plate member; and
a belleville washer, having narrow and wide ends thereof, disposed such that said wide end is in contact with said inner surface of said first plate member, said wide end being retained within said retaining wall, whereby said belleville washer is disposed such that a compressive load applied to the outer surfaces of said plate members is counteracted by the washer;
said belleville washer including at least one radially extending groove and at least one spiral slot.
12. The device as set forth in claim 11, wherein said at least one radially extending groove in said belleville washer comprises a plurality of spaced apart radially extending grooves, each of which extends from a locus on a peripheral edge of said belleville washer to a locus which is radially in from said peripheral edge.
13. The device as set forth in claim 12, wherein each of said plurality of radially extending grooves in said belleville washer comprises a linear groove having a length extending from said locus on said peripheral edge toward said locus which is radially in from said peripheral edge, a depth that tapers along said length, and a width that tapers along said length.
14. The device as set forth in claim 13, wherein said depth decreases along said length, and said width decreases along said length.
15. The device as set forth in claim 11, wherein said at least one spiral slot in said belleville washer comprises a plurality of spaced apart spiral slots, each of which extends from a locus on a peripheral edge of said belleville washer to a locus which is radially in from said peripheral edge.

16. The device as set forth in claim 11, wherein said second plate member further comprises a post structure extending outwardly from said inner surface of said second plate member, and which post structure includes a ball-shaped head.

17. The device as set forth in claim 16, wherein said post structure further includes a threaded bore which extends axially from said ball-shaped head toward said inner surface of said second plate member, and which bore receives therein a threaded set screw such that prior to an insertion of the set screw therein, said bore permits the ball-shaped head to compress radially inwardly, and such that after the insertion of said set screw said ball-shaped head is not readily radially compressible.

18. The device as set forth in claim 16, wherein said belleville washer further comprises a central opening which includes a curvate volume for receiving and holding therein said ball-shaped head.

19. An intervertebral spacer device comprising:

first and second plate members, each having plate surfaces thereof, said plate members being disposed in a spaced apart relationship such that inner ones of said plate surfaces oppose one another, and outer ones of said plate surfaces face in opposite directions;

said first plate member further including a retaining wall extending outwardly from said inner surface of said first plate member;

said second plate member further including a post structure extending outwardly from said inner surface of said second plate member, said post structure including a ball-shaped head; and

a belleville washer, having narrow and wide ends thereof, said narrow end including a central opening which includes a curvate volume for receiving and holding therein said ball-shaped head, said wide end of said washer being in contact with said inner surface of said first plate member and retained within said retaining wall of said first plate member;

said belleville washer further including a plurality of spaced apart radially extending grooves, each of which extend along inwardly directed directions from a locus on a peripheral

edge of said belleville washer to a locus which is radially in from said peripheral edge;

said belleville washer further including a plurality of spaced apart spiral slots, each of which extend along inwardly directed curved directions from a locus on said peripheral edge of said belleville washer to a locus which is radially in from said peripheral edge;

said belleville washer being disposed such that a compressive load applied to the outer surfaces of said plate members is counteracted by the restoring force of said washer.